Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.





FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEY and WATER SUPPLY FORECASTS for

COLORADO, RIO GRANDE, PLATTE and ARKANSAS DRAINAGE BASINS

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE, and

COLORADO AGRICULTURAL EXPERIMENT STATION, STATE ENGINEER of COLORADO and STATE ENGINEER of NEW MEXICO

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, National Park Service, Bureau of Reclamation, State Engineers of Utah and Wyoming; and other Federal, State and private organizations.

FEB. 1, 1958

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	COOPERATING WITH	LOCATION
COLORADO, RIO GRANDE	MONTHLY (FEBMAY)	Colo. Exp. Station	FT. COLLINS, COLO.
COLUMBIA Includes Alaska	MONTHLY (JANMAY)		BOISE, IDAHO
UPPER MISSOURI	MONTHLY (FEB MAY)	Mont.Agr.Exp.Station	BOZEMAN, MONTANA
WEST-WIDE	SEMI-ANNUALLY (OCT. 1 AND APR.1)	COOPERATORS	PORTLAND, OREGON
STATES			
ARIZONA		SALT R. VALLEY WATER	PHOENIX, ARIZONA
NE VADA	MONTHLY (FEBAPR.)	NEVADA STATE ENGINEER	RENO. NEVADA
ORE GON	MONTHLY (JANMAY)	ORE.AGR.EXP.STATION	PORTLAND, OREGON
UTAH	Monthly (JanMay)	UTAH STATE ENGINEERUTAH AGR.EXP.STATION	SALT LAKE CITY, UTAH
WASHINGTON	Monthly (FEBMay)	WASH, STATE DEPT, OFCONSERVATION AND DEVELOPMENT	Spokane, Washington
WYOMING	Monthly (FebJune)		
Copies of th	e various reports may be	secured from: Head, Water Sup Soil Conservati	ply Forecasting Section on Service

209 S.W. 5th Avenue, Portland 4, Oregon

PUBLISHED BY OTHER AGENCIES

BRITISH COLUMBIA	(FEBJUNE)
CALIFORNIAMonTHLY	(FEBMAY)

FEDERAL-STATE COOPERATIVE

SNOW SURVEYS AND WATER SUPPLY FORECASTS

for

COLORADORIVER, PLATTE RIVER ARKANSAS RIVER AND RIO GRANDE DRAINAGE BASINS

Issued

February 10, 1958

Report Prepared By
Homer J. Stockwell, Snow Survey Supervisor
Fort Collins, Colorado
Jack N. Washichek, Assistant Snow Survey Supervisor
Fort Collins, Colorado

United States Department of Agriculture
Soil Conservation Service
and
Colorado Agricultural Experiment Station
Fort Collins, Colorado
and
State Engineer of Colorado
Denver, Colorado
and
State Engineer of New Mexico
Santa Fe, New Mexico

Issued By

Kenneth W. Chalmers State Conservationist Soil Conservation Service

Sherman S. Wheeler, Director Colorado Agricultural Experiment Station J. E. Whitten State Engineer State of Colorado

S. E. Reynolds State Engineer State of New Mexico

General Series Paper No. 674 Colorado Agricultural Experiment Station

Snow Survey measurements in Wyoming, Utah, and Arizona are supplied by Snow Survey Supervisors, Soil Conservation Service, in those states.

WATER SUPPLY OUTLOOK COLORADO, RIO GRANDE, PLATTE AND ARKANSAS DRAINAGE BASINS February 1, 1958

WATER SUPPLY OUTLOOK AS OF FEBRUARY 1 CONTINUES TO BE FAIR TO GOOD FOR ALL IRRIGATED AREAS OF COLORADO AND NEW MEXICO. EARLY SEASON SNOW PACK IS NEAR NORMAL IN BOTH STATES WITH A SUBSTANTIAL EXCESS IN SOUTHWESTERN COLORADO. IF SNOWFALL FOR THE REMAINDER OF THE SEASON IS NEAR AVERAGE, IRRIGATION WATER SUPPLY IN THE TWO STATES WILL BE GENERALLY ADEQUATE EXCEPT FOR LIMITED SHORTAGES IN LOCAL AREAS, PARTICULARLY ALONG THE RIO GRANDE IN NEW MEXICO.

SURFACE WATER SUPPLY OUTLOOK FOR ARIZONA IS POOR. FALL AND WINTER PRECIPITATION HAS BEEN DEFICIENT. STORAGE IN RESERVOIRS IS BELOW NORMAL.

As indicated by the present snow pack, runoff in mountain streams is not likely to exceed normal during the 1958 irrigation season. The water supply outlook is improved materially due to the relatively large carryover reservoir storage from the heavy stream flow of 1957. Water in storage in most reservoirs is well above average and many contain several times the amount stored on this date a year ago. Soil moisture in irrigated areas is generally regarded as good compared to recent drouth years. Moisture under the snow in the mountains is better than average in southern and western Colorado and northern New Mexico, but is relatively dry on the watersheds of the northern tributaries of the South Platte and the Yampa and White Rivers.

Although present water supply outlook is favorable, much will depend on snow accumulation during the remainder of the snow season. As of February 1 less than one-half of the snow season is completed.

SOUTH PLATTE. Streamflow in the South Platte and its tributaries near the mountains may be less than normal unless snow pack conditions improve. However, storage in the Colorado-Big Thompson system as well as in smaller irrigation reservoirs is well above average and a year ago. This storage will be available to supplement stream flow. Soil moisture conditions in irrigated areas are good. All factors add up to a water supply that should be reasonably adequate to meet the usual demands. Some shortages may occur on the lower South Platte below Greeley. Storage is above normal and winter streamflow is expected to fill reservoirs; but should late season snowfall and summer precipitation be deficient some water shortage may be expected.

ARKANSAS. Snow pack is slightly less than normal as of February 1 but the water supply outlook is good. Excessive streamflow during the summer of 1957 allowed for substantial increases in reservoir storage on all irrigation systems including John Martin Reservoir. This situation is in direct contrast to a year ago when reservoir storage in the valley was practically non-existent. Soil moisture conditions in the valley are described as good. Soils under the snow in the mountains is relatively wet. In summary, water supply along the main stem of the Arkansas River will not be excessive as in 1957 but will be one of the better water supplies in recent times. Some shortage may occur on southern tributaries depending on spring snowfall.

RIO GRANDE. Snow accumulation to date is near average on the watershed of the Rio Grande in both Colorado and New Mexico. Soil moisture conditions under the snow pack are excellent. Reservoir storage in San Luis Valley is well above average and a year ago. Soil moisture conditions in the valley are good. With average snow fall for the remainder of the season water supplies should be adequate. Along the Rio Grande in New Mexico some shortages are expected for both the middle and lower Rio Grande Districts. One good year was not sufficient to recover from an extended drouth. Storage in Elephant Butte has improved markedly as compared to storage in recent years. With this stored water, the water supply below Elephant Butte will probably be comparable to that which could have been available last year.

COLORADO RIVER. Flow of the Colorado River tributaries in Colorado should be at least normal as indicated by the snow pack to February 1. Water supply outlook for the principal irrigated areas is good. Soils of crop lands are relatively wet. Streamflow has been near average during the winter season. Inflow to Lake Mead for the 1958 snow melt season is expected to be about normal.

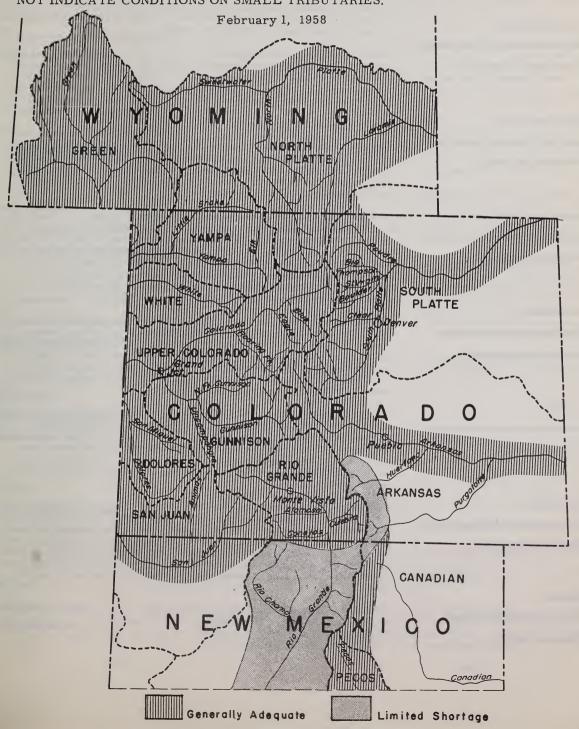
NORTH PLATTE. The water supply outlook for irrigated areas along the North Platte in eastern Wyoming and Western Nebraska is excellent. Inflow to Seminoe Reservoir will probably be about average. For additional water supply there is now stored in the four major reservoirs in Wyoming about 1,500,000 acre-feet which is near twice the normal carryover. Soil moisture conditions in irrigated areas are good. Water supply outlook for the Wheatland district on the Laramie River is also good but not as favorable as on the North Platte.

ARIZONA. Surface water supply outlook for Arizona for 1958 is below average. There is practically no snow on the mountains in the state. Soil moisture conditions are relatively good in mountain areas. The eight reservoirs on the Gila, Salt, Verde and Agua Fria Rivers have in storage about 530,000 acre-feet which is 150 per cent of last year, but only 65 per cent of average and 15 per cent of capacity.

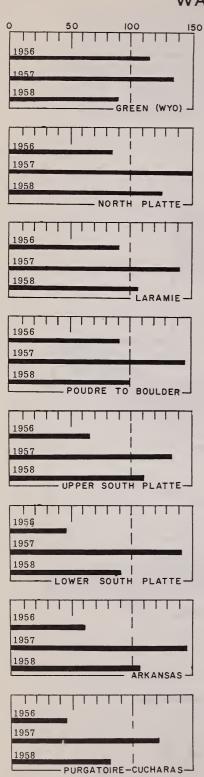
UTAH. Snow cover ranges from slightly above normal on the Duchense and Price River watersheds in Northern Utah to a little less than normal on the Virgin River and other southern Utah tributaries to the Colorado rivers. Soil moisture conditions in both mountain and valley districts are fair to good.

WATER SUPPLY OUTLOOK

THE MAP ON THIS PAGE INDICATES THE MOST PROBABLE WATER SUPPLY AS OF THE DATE OF THIS REPORT. ESTIMATES ASSUME AVERAGE CONDITIONS OF SNOW FALL, PRECIPITATION AND OTHER FACTORS DURING THE SPRING AND EARLY SUMMER MONTHS. AS THE SEASON PROGRESSES ACCURACY OF ESTIMATES IMPROVE. IN ADDITION TO EXPECTED STREAMFLOW, RESERVOIR STORAGE, SOIL MOISTURE IN IRRIGATED AREAS, AND OTHER FACTORS ARE CONSIDERED IN ESTIMATING WATER SUPPLY. ESTIMATES APPLY TO IRRIGATED AREAS ALONG THE MAIN STREAMS AND MAY NOT INDICATE CONDITIONS ON SMALL TRIBUTARIES.



WATER SUPPLY OUTLOOK



Average

THE BAR CHARTS ON THIS AND THE NEXT PAGE REPRESENT GRAPHICALLY THE MOST PROBABLE WATER SUPPLY OUTLOOK FOR 1958 AS COMPARED TO THE PAST YEARS 1956 AND 1957. STREAMFLOW AND OTHER FACTORS FOR 1957 ARE PARTIALLY ESTIMATED BECAUSE FULL DATA ON WATER SUPPLY CONDITIONS IS NOT YET AVAILABLE. ESTIMATES OF PAST CONDITIONS AND FORECASTS HAVE BEEN MADE BY THE AUTHORS OF THIS REPORT.

GREEN: The flow of the Green in Wyoming and Utah will be about average and adequate to meet local irrigation needs. Winter snow pack and fall precipitation have been slightly below normal.

NORTH PLATTE: Water supply on the North Platte should meet demands this year even if late season snowfall is deficient. Present indications are for about normal inflow to Seminoe and Pathfinder reservoirs. In addition there is now stored in Seminoe, Pathfinder, Alcova and Guernsey reservoirs about 1,500,000 acre-feet which is almost twice normal and over twice that of a year ago. Of this amount about 850,000 acre-feet is assigned to the Kendrick project.

LARAMIE: At the present time the snow and soil moisture measurements indicate that streamflow will be somewhat below normal on the Laramie River in 1958. With 73,000 acre-feet in storage in Wheatland Reservoir the water supply for the Wheatland area will be much better than for any recent year preceding last year.

POUDRE-BOULDER: Unless the rate of snow accumulation increases, the flow of the Poudre, Big Thompson and Saint Vrain Rivers and Boulder Creek will be less than normal in 1958. The bar chart considers the improvement in the storage in smaller irrigation reservoirs as compared to normal. In addition there is a total of about 200,000 acre-feet in Horsetooth and Carter Lake reservoirs and over 300,000 acre-feet in Granby, most of which is available for a supplemental water supply. Soil moisture conditions in irrigated areas are good. Present streamflow is above normal.

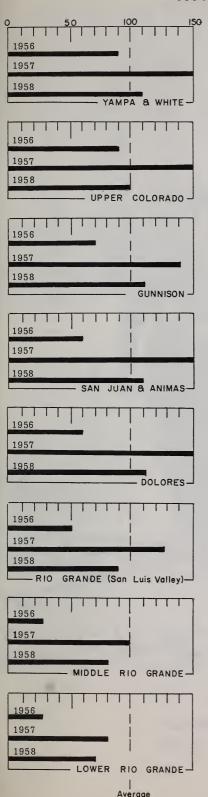
UPPER SOUTH PLATTE: Snow and soil moisture measurements indicate that the summer flow of the Upper South Platte River and Clear Creek will be near normal. Municipal reservoirs of the City of Denver were filled during snow melt last summer and are still at about 90 per cent of capacity. Storage in irrigation reservoirs is also relatively high. Soil moisture conditions are good. Shortages will occur only if late season snowfall is extremely deficient. An excess of water is not probable.

LOWER SOUTH PLATTE: The water supply outlook for the lower South Platte is relatively good. Streamflow in this area is more dependent on summer rainfall and irrigations demands during the runoff period. Major reservoirs have more than a normal amount of water in storage and can be expected to fill from a better than average winter streamflow. If average snowfall continues and spring and summer rainfall is normal this area will have a good water year.

ARKANSAS: Snow accumulation is about normal. The most probable summer streamflow of the main stream at points above Pueblo will be slightly less than normal. In contrast to the past several years reservoir storage is excellent. Last year storage throughout the valley was practically non-existent. John Martin reservoir now has in storage about 260,000 acre-feet. Usually the water content is near zero. Storage in reservoirs materially improves the outlook. In contrast to recent years, valley soil moisture is reported as good.

PURGATOIRE-CUCHARAS: Water supply outlook is fair to good for the Purgatoire, Cucharas and Huerfano Rivers. Much of the water supply depends on later precipitation.

WATER SUPPLY OUTLOOK



YAMPA-WHITE: Snowpack is near normal on the headwaters of the Yampa River and somewhat above normal on the White River headwaters. Water supply for next year will be adequate to meet demands. No excessive streamflows are anticipated. Soil moisture conditions in valley areas are fair to good.

UPPER COLORADO: Snowpack and soil moisture conditions are about normal on the upper Colorado River watershed. Most probable summer streamflow will be near average. Soil moisture conditions at lower elevations are fair to good which indicates a fair outlook for the limited irrigated areas along the small tributary streams.

GUNNISON: Water supply outlook for irrigated areas served by the Gunnison, North Fork and Uncompander Rivers is good for 1958. Snowpack is slightly below normal on the Continental Divide but well above normal on the Grand Mesa and on Red Mountain Pass. Taylor Park reservoir contains 83,000 acre-feet as compared to 60,000 for normal and 20,000 a year ago. Soil moisture conditions in valley areas are good and streamflow is above normal.

SAN JUAN-ANIMAS: Although the most probable streamflow for 1958 is expected to be a little less than normal water supplies will be adequate for most areas of the basin. Streams such as the Florida and LaPlata may have some late season shortage. Valley soils are wet. Mountain soils under the snow are at field capacity.

DOLORES: Summer flow of the Dolores is expected to be about average but much less than for a year ago. Storage in Groundhog reservoir is 15,000 acre-feet or nearly twice normal. Soils on the Montezuma project are wet. With average snowfall for the remainder of the winter season, water supplies should be adequate for 1958.

RIO GRANDE (San Luis Valley): Streamflow into San Luis Valley in the Rio Grande, Conejos and Alamosa Rivers will probable be slightly less than than average for 1958 and less than for 1957. The water supply outlook is average. Reservoir storage is between two and three times normal and perhaps ten times that of a year ago. Excessive streamflow in 1957 has been used to restore sub-soil moisture. Valley soil moisture conditions are described as good.

MIDDLE RIO GRANDE (New Mexico): Snowpack in northern New Mexico is about normal for this date. Soil moisture conditions in mountain areas are excellent due to heavy fall rains. At extremely high elevations a heavy snowpack has been reported. However, because of the lack of snow cover at lower elevations the outlook is for slightly less than normal flow for the Rio Grande in northern New Mexico. Water supply should be reasonably adequate along the tributaries. The Middle Rio Grande District may expect a fair water year even if total supplies are less than the 1938-52 average.

LOWER RIO GRANDE (New Mexico): Inflow to Elephant Butte will probably be about three quarters of normal this year but much will depend on later snowfall and summer storms. Storage in Elephant Butte and Caballo reservoirs is about 800,000 acre-feet or 75 per cent of normal. The water supply outlook is the best for many years, even if the total surface water supply is expected to be less than normal.

Water supply outlook for the Carlsbad Project on the Pecos River is good with 100,000 acre-feet of water stored in Alamogordo reservoir. Soil moisture conditions in the irrigated area are good.

FOR DETAILS ON WATER SUPPLY CONDITIONS ON THE COLORADO RIVER DRAINAGE IN UTAH AND ARIZONA, NOT LISTED OR DISCUSSED IN THIS REPORT, REFERENCES SHOULD BE MADE TO THE STATE SNOW REPORTS FOR UTAH AND ARIZONA (see inside cover).



GLEN BRADO AND MORLEY NELSON Preparing to measure a snow course

STATUS OF RESERVOIR STORAGE February 1, 1958

	USABLE		ABLE S' 1000 A.	TORAGE F.		USABLE		BLE ST	TORAGE F.
RESERVOIR	CAPACITY 1000 A.F.		1957	15-yr. Avg. 1938-52	RESERVOIR	CAPACI' 1000 A. H		1957	15-yr. Avg 1938-52
	1000 11.1.			1000 02		1000 11.1	. 1000	100.	1000 02
NOR'	TH PLATTE	DRAIN	AGE			ARKANSAS			
Win releas	1000 0	925.4	565.0	1087.7*	Twin Lakes	57.9	38.3	8. 2	
Kingsley	1900.0 70.0		26.0	47.6	Sugar Loaf	17.4	15.2	5.0	
Sutherland Minatare	70.0 58.8	33.8	7.0	23.4	Clear Creek	11.4	11.0	5.4	
Alcova	166.0		171.7	82.3	Meredith	41.9	27.0	0.0	
Seminoe	970.0	613.9	285.7	381.3	Horse Creek	26.9	22.6	0.0	
Guernsey	44.3	28.0	36.7		Adobe Creek	61.6	58. 7 	0.0	
Pathfinder	1040.5	654.9	234.9	348.9	Cucharas	40.0	261.6	1.7	
Kortes	4.7	4.7	4.5	*	John Martin	655.0	41.3	0.0	
1101163	2. (-• -			Great Plains	150.0	6.1	0.0	
SOI	JTH PLATTI	E DRAIN	JAGE		Model	15.0	237.0	156.3	
500					Conchas (NM) WCAustin	600.0 151.0	87.1	9.3	
Windsor	18.6	13.5	0.8	8.2	WCAustin	151.0	01.1	0.0	00.0
Cache la Poudre		8.3	4.3	5.5		COLORADO) DD A INI A	CF	
Fossil Creek	11.6	7.1	2.0	6.1	Taylor Park	106.2	83. 3	19.7	60.1
Terry Lake	8.2	5.1	4.1	3.9	Vallecito	126.3	61.7	19.1	
Halligan	6.4	4.7	2.1	1.5	Groundhog	21.7	15.0	1.5	-
Chambers Lake	8.8	1.9	1.0	2.4	Granby	467.5	320.0		
Cobb Lake	34.3	19.0	0.0	4.6	Green Mountain		112.8	67.2	
Black Hollow	8.0	3.3	3.3		Lake Mead	27,207.0			
Carter	112.4	84.3	53.6	*	Lake Havasu	688.0	565.9	596.6	
Horsetooth	143.5	97.0	69.6		Lake Mohave	1,810.3	1541.8		
Lake Loveland	14.3	7.6	8.3			1,010.0			
Boyd Lake	44.0	42.2	4.7		RIO	GRANDE (COLO) DR	AINAG	E
Lone Tree	9.2	7.5	1.2		Rio Grande	45.8	40.9	3.8	
Mariano	5.4	5.0	3.7		Santa Maria	45.0	14.5	2.6	8.9
Union	12.7		2.3		Sanchez	103.2	35.0	3.0	
Eleven Mile	81.9	92.5	23.7		Terrace	17.7		1.0	
Cheesman	79.0	79.1	22.4		Continental	26.7	11.0	2.4	6.9
Marston	18.9	13.9	15.5	14.4	Platoro	60.0	30.4	1.0	*
Antero	33. 0	17.8	0	13.6					
Gross	00.0	37.6	13.2			GRANDE (N. M.) DR	AINAG	E
Barr Lake	32.2	24.2	10.5		Elephant Butte		773.1	46.6	892.6
Milton	24.4	15.4	0.0		Caballo	365.0	49.5	7.6	173.3
Standley	18.5	12.8	4.4		El Vado	226.0	13.2	0.3	58.8
Marshall	10.3	6.6	0.1	2.1	Alamogordo	128.0	101.0	10.0	
Horse Creek Riverside	20.6 57.5	12.5	1.2	7.6 38.5	McMillan-Aval		18.5	13.4	
Empire	37. 7	52.2 30.4	21.2 10.0		Red Bluff(Tex)	307.0			88.5*
Jackson Lake	35.4								
Prewitt	32.8	26.5 25.0	24.8			ALT AND G			
Point of Rocks	70.0	65.1	20.6		Roosevelt	1,382.0	44.4	123.5	
Julesburg	28.2	19.8	18.0		Horse Mesa	245.1	207.0	80.9	
o aresburg	20.2	13.0	10.0	20.0	Mormon Flat	58.0	54.4	54.7	
					Saguaro	70.0	56.0	47.9	
* Shorter period	s				Bartlett	180.0	106.3	77.2	
Shorter period					Horseshoe	143.0	1.8	23.3	
					Carl Pleasant San Carlos	163.8 1,205.0	7.6	20.1	
					San Carlos	1,200.0	56.3	7.6	107.1

COOPERATIVE SNOW SURVEYS SUMMARY OF SNOW MEASUREMENTS February 1, 1958

WATERSHEDS	No. of Courses	Years of		Content rcent of	WATERSHEDS	No. of Courses	Years of		Content ercent of
	Averaged	Record	1957	Avg.		Averaged	Record	1957	Avg
ARKANSAS RIVER					PLATTE RIVER				
Arkansas River	6	17-22	63	96	Sweetwater	2	16	81	73
					North Platte River	9	18-20	75	101
COLORADO RIVER					Laramie River	7	14-21	74	97
Colorado River*	12	16-22	83	100	South Platte River**	1	19	76	127
Roaring Fork	1	22	62	90	Poudre River	5	14-19	98	114
Plateau Creek	2	13-21	96	144	Big Thompson River	2	17-19	99	92
Yampa River	2	20-22	81	107	St. Vrain River	1	20	69	70
White River	2	18-21	84	127	Boulder Creek	1	19	71	93
Gunnison River	7	14-22	72	111	Clear Creek	2	16-18	80	85
Dolores River	2	18-19	81	98					
Green River (Wyo.)	-				RIO GRANDE				
San Juan River	5	16-18	54	93	Rio Grande (Colo.)	3	18-19	63	110
Animas River	2	19-21	73	126	Rio Grande (N. M.)	8	16-19	90	116
Gila River	7	12-20	48	24	Conejos River	2	17-19	43	67
Salt River	5	17-20			Chama River	4	16-19	54	82
Verde River	6	10-12			Pecos River	1	16	111	114
Little Colo. River	5	11-20			Canadian River	3	16-19	101	132
Williams River	3	9-12			Alamosa River	2	13-18	60	96
Lower Colo. River	4	10-11	24	31					
*Above Glenwood Sp	rings				**Above Denver				

VALLEY PRECIPITATION 1

Division Averages and Departures $\frac{3}{2}$

		Fall	Wi	nter		Fall		W	inter
DRAINAGE	Sept.	-OctNov.	Dec.	2/	DRAINAGE	Sept.	-OctNov.	Dec.	_ 2/
DIVISIONS	Avg.	Dept.	Avg.	Dept.2/	DIVISIONS	Avg.	Dept.	Avg.	Dept.
North Platte River, Wyo.	2, 95	≠. 13	. 36	36	Colorado River, Ariz.	3, 92	∤.63	. 50	75
South Platte River	3.20	· /. 13	. 09	41	Gila River, Arizona	2, 35	50	.40	64
Arkansas River	4.24	<i>†</i> 1.33	. 29	28	Canadian River, N.M.	6.90	<i>∤</i> 3.36	. 01	50
Colorado River	5.22	<i>†</i> 1.11	1.26	25	Rio Grande, Colo.	3,51	<i>f</i> 1.03	. 06	44
Green River, Wyo.	2.48	06	. 44	09	Rio Grande, (N), N. M.	5.77	<i>f</i> 2.09	.50	-, 61
San Juan River, N.M.	3.59	f.74	. 52	34	Rio Grande (S), N. M.	3.06	<i>f</i> .64	. 07	46
		·			Pecos River, N.M.	7.14	√3.56	. 05	52
Preliminary analysis by furnished by Meteorolog Bureau					<u>2</u>/ Departure from aver<u>3</u>/ Selected Stations	rage	,		

SNOW COURSE		Depth 1958		r Conte	ent ,	Years of	SNOW COURSE		Depth 1958		r Conte	nt	Years of
SNOW COOKSE		nches		1957	Avg.	Record		Date	Inches	1958	1957	Avg.	Record
3	PLATT	E RIV	ER DRA	INAGE		**	P	LATT	E RIVE	R DRAIN	NAGE		**
and the same of th							CLEAR CREEK						
SWEETWATER RI' Grannier Meadows		33	7.0	8.4	9.6	16	Loveland Pass	1/28	32	6.3	9.6	8.3	18
South Pass*	2/2	30	7.1	9.0	9.8	16	Grizzly Peak*	1/30	52	10.4	11.3		16
Larsen Creek	2/3	37	9.1				Empire		NS	NS	5.9		9
							Berthoud Falls	1/30	31	5.0	10.6		7
NO. PLATTE RIVI		0.0	10.0	10.0	10.5	10	Clear Creek	1/28	35	7.4	11.5		6
Cameron Pass (a)	$\frac{2}{2}$ $\frac{2}{1}$	60 21	13.2 3.7	12.8 7.8	12.5	19 20	SOUTH PLATTE R	מיזוו					
Park View Columbine Lodge	1/30	63	14.9	18.1	14.3	22	Hoosier Pass	1/30	35	8.4	11.0	6,6	19
Willow Cr. Pass*	1/29	30	6.2	10.0	7.6	18	Jefferson Cr.	,	NS	NS	7.4	4.9	18
Northgate	1/30	19	2.6	5.8	4.4	8	Geneva Park		NS	NS	3.9		9
Bottle Creek	1/30	34	7.9	13.3	8. 2	20							
Webber Spring	1/30	42	9.9	16.5	10.8	20	AR	KANS	AS RIVE	R DRAI	NAGE		
Old Battle	1/30	70	21.1	26.6	19.2	20 20	ADVIANCE DIVID						
N. French Creek	2/1	 58	14.1	24.1 15.4	16.4 11.6	20	ARKANSAS RIVER Tennessee Pass	1/31	31	5.4	8.4	5.6	22
N. Barrett Creek	2/1	32	7. 1	10.0	6.8	20	Twin Lakes T.	1/24	25	5.6	6.8	6.9	20
Ryan Park	2/1	02		10.0	0.0	20	La Veta Pass*	2/1	23	5.0	12.4	5.6	18
Albany	2/4	37	9.1	10.9		9	4 Mile Park	1/31	17	2.7	5.7	2.9	18
LaBonte	1/29	17	. 3. 1	4.7		9	Fremont Pass	1/29	50	9.3	11.6	9.6	
Boxelder	1/29	19	3.4	5.0		7	Blue Lakes		NS	NS	NS		
							Monarch Pass	1/31	49 NC	11.4 NS	17.7 11.2	10.5	· 17
LARAMIE RIVER	0/0	4.4	10 1	10.7	10.7	1.6	Saint Elmo (a)		NS	MS	NS		6
Roach (a)	$\frac{2}{2}$	44 42	10.1 9.2	10.7 9.5	10.7	16 14	Timberline East Fork		NS	NS	7.5		4
Deadman Hill*(a) McIntyre	4/4	NS	NS	NS			Westcliffe		NS	NS	NS		
Brooklyn Lake	1/28	48	13.0	17.0	13.6	20	Bourbon		NS	NS	NS		
Fox Park	2/3	21	4.1	6.4	4.0	21							
Pole Mtn. *	1/29	11	1.6	5.7	3. 1	21	co	LORA	DO RIV	ER DRA	INAGE		
Libby Lodge	1/28	27	6.2	8.8	6.2	20							
Hairpin Turn	1/28	26	6.1	9.6	7. 1	20	COLORADO RIVER	. ,		ood Spr 13.2	ings) 12.8	12.5	19
Albany	2/4	37	9.1	10.9		9	Cameron Pass*(a) Phantom Valley	$\frac{2}{2}$	60 33	5.7	7.3	6.2	21
POUDRE RIVER							Hoosier Pass*	1/30	35	8.4	11.0	6.6	
Cameron Pass (a)	2/2	60	13.2	12.8	12.5	19	Berthoud Pass	1/31	49	9.4	9.7	9.2	21
Chambers Lake	2/2	25	5.8	8.2	5.0	19	Tennessee Pass	1/31	31	5.4	8.4	5.6	21
Big South	2/2	13	2.6	2.5	1.7	19	M. Fork Camp Gr.	1/31	32	5.2	7.5	6.3	21
Deadman Hill (a)	2/2	42	9.2	9.5	7.3	14	Fiddler Gulch		NS	NS	NS		
Lake Irene*	1/30	63	14.8	13.4	13.4	19	Lulu	1/29	NS 30	NS 6.2	NS 10.0	7.6	18
Hour Glass Lake	1/30 1/30	19 14	2.6 2.8	NS 6.7		9	Willow Creek P. N. Inlet Grand L.	1/25	NS	NS	NS	5.8	
Red Feather Lost Lake	2/2	30	7.7	10.7		7	Lake Irene	1/30	63	14.8	13.4	13.4	
Lost Lake	-,-						Arrow	1/31	33	5.7	9.7	5.8	19
BIG THOMPSON RI	VER						Lapland		NS	NS	NS		
Lake Irene*	1/30	63		13.4		19	Fremont Pass	1/29	50	9.3	11.6	9.6	22
Hidden Valley	1/29	24	4.8	6.3	7.8	17	Lynx Pass	1/29	NS 52	NS 10.7	NS 13.1	10.5	16
Deer Ridge	1/29	9	1.6	3.3		9 7	Shrine Pass	1/30	52 52	10. 7	11.3	11.3	16
Longs Peak Tw o-Mile	$\frac{2}{1}$	23 35	4.5 7.1	8.8 9.3		5	Grizzly Peak Glen-Mar Ranch	1/28	25	3.9	6.6		10
THE THILL	-, 20						Monarch Lake		NS	NS	NS		
ST. VRAIN RIVER							Granby	1/29	22	3.7	6.8		9
Wild Basin	1/30	31	6.0	8.7	8.6	20	Grand Lake	1/30	27	3.8	6.3		9
Copeland Lake	1/30	14	2,3	4.5	~	9	Berthoud Summit	1/31	51	11.0	13.9		7 7
Ward	1/30	11	2.6	4.9		8	Frazer View	1/29	NS 31	NS 5.3	7.6 9.7		6
BOILI DED CDEEK							Gore Pass Frisco	1/30	28	5.1	6.9		7
BOULDER CREEK University Camp	1/30	43	10.7	15.0	11.5	19	Snake River	-, 00	NS	NS	7. 1		7
Moffat	1/30	28	5.9	7.5		8	Summit Ranch		NS	NS	NS		
Boulder Falls	1/30	31	5.0	7.3		5	Vail Pass	1/29	55	9.1	14.7		4
							Pando		NS	NS	9.7		4
							Kokomo	1/29	37	5.8	8.9		4 5
 On adjacent drai 	inage						Milner	1/31	42 30	8.3 6.0	8.5 7.5		5 1
** 4		with la	se than	15 year	s of re	ecord	Blue River	1/30	30	0.0	1.0		
** Averages for co								1/30	36	7 2	11 9		1
** Averages for co during the perio NS No Survey							Jones Pass Ranch Creek	1/30 1/31	36 28	7.2 4.5	11.9 8.2		1 1

SNOW COURSE MEASUREMENTS

February 1, 1958

CNOW COMPAN		Depth		r Conter	nt	Years	CNOW COMPON		Depth		r Conte	nt	Years
SNOW COURSE	Date	1958 Inches		Inches 1957	Avg.	of Record	SNOW COURSE	Date :	1958 Inches	1958	Inches 1957	Avg.	of Recor
						**							**
CO.	LORA	DO RIV	ER DR	AINAGE			CO	LORA.	DO RIV	VER DR	AINAGI	Ξ	
ROARING FORK							DOLORES RIVER			_			
Ind. Pass Tunnel	1/24	37	9.3	14.9	10.4	22	Rico	1/31	29	5.2	8.9	6.4	18
North Lost Trail(a))	NS	NS	18.2	7.5	16	Telluride	1/31	35	6.2	5.2	5.2	19
Vast		NS	NS	10.0			Lizard Head	1/21	NS	NS	NS		
vanhoe Lift		NS	NS	12.9 17.9	11.4	12 1	Trout Lake	1/31	50	8.3	10.7		9
711.0		1/10	1/10	17.9		1	SAN RAFAEL RIV	ਰਜ					
AMPA RIVER							Hntngtn-Horseshoe		59	19.3	16.6		7
Ory Lake (a)		NS	NS	18.2	11.9	17	Seeley Creek R. S.		NS	NS			
Columbine Lodge*	1/30	63	14.9	18.1	14.3	22	Scored Croom IV. S.		1.0	110			
Elk River (a)	-,	NS	NS	16.1	9.6	18	VIRGIN RIVER						
ynx Pass*		NS	NS	NS			Long Valley Jnct.	2/3	4	0.8	4.3		6
Routt Line		NS	NS	25.0		7	Harris Flat R.S.	2/3	19	4.8	6.9	6.9	12
Rabbit Ears		NS	NS	25.1		7	Duck Creek R. S.	2/3	34	8.6	12.4	10.2	14
Yampa View		NS	N.S	13.2		7	Cedar Breaks		NS	NS			
Flat Top		Drop	ped	NS			Webster Flats	1/28	43	10.7	10.0		6
Bear River		NS	NS	NS							•		
Clark (a)		NS	NS	14.5		2	COLORADO R. (S. 1	e. ut/					
Old Battle	1/30	70	21.1	26.6	19.2	20	LaSal Mt.		NS	NS			
							Buckboard Flat		NS	NS			
HITE RIVER													
Burro Mountain (a)	· · ·	58	15.0	13.3	10.4	22	PRICE RIVER	. /					
Rio Blanco	2/1	41	10.0	16.3	9.3	18	Indian Canyon*	1/29	28	7.2	6.6	6.9	22
							Gooseberry Res.	2/4	42	12.3	13.2		7
LATEAU CREEK	0/1						Staley Ranch	1/31	26	5.6	6.4	5.5	16
lesa Lakes	2/1	65	16.0	14.8	9.2	21	Dry Valley Divide	1/31	33	7. 6	8.0	7.3	16
rickle Divide (a)	1/30	65	19.5	22.1	15.4	13	Hntngtn-Horseshoe		20	0.0	16.0		7 2
STIMMICON DIVIED							Mud Creek	1/31	39	8.8	11.4		2
GUNNISON RIVER Crested Butte	1/31	36	6.6	14.0	8.6	22	DUCHESNE RIVER						
Park Cone		26	5.0	14.9 12.8	6.0	22	Lake Fork Mt.	2/1	34	8.5	6.6		7
lexander Lake (a)	$\frac{1}{28}$ $\frac{2}{3}$	55	15.3	16.5	13.2	21	Paradise Park	1/31	33	8.4	7.4		5
ronton Park	$\frac{2}{3}$	46	11.6	11.7	7.3	21	Mosby Mt. (L)	1/31	29	6.8	5.9		5
rickle Divide (a)	1/30	65	19.5	22.1	15.9	14	Brown Duck Lake	1,01	NS	NS			
ark Reservoir(a)	2/3	56	15.5	21.0	14.3	14	Indian Canyon	1/29	28	7, 2	6.6	6.9	22
orphyry Creek	1/31	47	9.8	17.2	9.6	18	Indian Canyon	'					
Kannah Cr.	1,01	NS	NS	NS			UPPER GREEN RI	VER (T	TAH				
ake City		NS	NS	NS			Hewinta R.S.		NS	NS			
pring Cr. Pass*		NS	NS	11.5			Hole-in-Rock		NS	NS			
ochetopa Pass*	1/31	23	4.3	4.9		9	King's Cabin (U)		NS	NS			
(cClure Pass(a)	,	NS	NS	19.8		4	King's Cabin (L)		NS	NS			
ed Mt. Pass		NS	NS	NS									
Blue Mesa		NS	NS	NS			CDEEN DIVER (III	7	a,				
							GREEN RIVER (WY Dutch Joe	1/30	32	6.6	7.7		2
ANT TILANI DISTED							Mulligan Park	1/28	26	4.4	7.4		2
AN JUAN RIVER	1/31	55	16.7	33.2	17.6	18	Kéndall R.S.	1/29	26	5.7	6.3		2
olf Creek Pass*	1/31	65	21.6	34.4	20.0	18	Loomis Park	1/20	NS	NS.	9.4		2
pper San Juan ranite Peaks	1/31	24	4.5	9.4	5.6		Snyder Basin R.S.		NS	NS	9.6		.2
a Plata	1/31	NS	NS	NS			Piney-LaBarge		NS	NS	11.9		1
olf Creek Summit	1/31	60	20.1	31.4		7	I mey Labarge				11.0		•
hama Dívide*	1/30	15	3.3	5.1	4.4		GILA RIVER						
hamita*	1/30	31	4.8	12.3	7.0		Frisco Divide	1/30	4	1.8	2.0	2.1	20
	2,00	0.1	0	12.0		10	State Line	1/30	4	1.8	2.5	2.9	20
NIMAS RIVER							Taylor Creek	1/31	ō	0.0	T	0.6	16
TATALLO TALVINIA							Inman	1/31	Ö	0.0	T	0.5	12
onton Park*	2/3	46	11.6	11.7	7.3	21	Nutrioso	1/30	T	T	1.0	2.5	20
ascade	2/3	35	7.9	14.9	8.2		Beaver Head	1/30	Ť	T	1. 1	3.0	18
pud Mt.	2/3	63	18.7	23.8		7	Coronado Trail	2/1	0	0.0	0.9	3.7	20
folas Lake	2/3	42	10.3	15.5		7	Rose Canyon	2/1			4.8	1.6	10
Iowardville	_, _	NS	NS	NS			Bear Wallow	2/1			4. 8	3.0	10
Mineral Creek		NS	NS	NS				,					
Red Mt. Pass*		NS	NS	NS									
On adjacent drai	nage						MS No Survey						
*				4.5		1	(a) Air observed						

^{**} Averages for courses with less than 15 years of record during the period 1938-52 are partially estimated.

MS No Survey
(a) Air observed

SNOW COURSE MEASUREMENTS

February 1, 1958

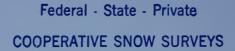
SNOW COURSE		Depth 1958	W	ater Contain Inches		Years of	SNOW COURSE		Depth 1958		nter Co n Inche		Years
SHOW COURSE	Date 1		`1958	1957		Record	SNOW COURSE		Inches				Record
C	OLORA	DO R	IVER DI	RAINAGE		**	R	IO GR	ANDE	DRAIN	AGE		**
SALT RIVER							RIO GRANDE IN CO	OT.ORA	DO				
Forest Dale	1/30	0	0.0	2.6	1.2	18	Pyramid	201411	NS	NS	NS		
McNary	1/30	0	0.0	2.8	3.0	19	Spring Creek		NS	NS	11.5		5
Nutrioso	1/31	0	0.0	1.0	2.5	20	Pool Table		NS	NS	NS		
Coronado Trail	2/1	2	0.3	0.9	3.7	20	L. Humphreys		NS	NS	NS		
Milk Ranch	1/30	0	0.0	2.7	1.9	17	Cochetopa	1/31	23	4.3	4.9		9
Workman Creek	1/30	T	Т	3.0	3.4	6	Red Mt.	,	NS	NS	NS		
Maverick Fork	1/30	16	4.4		6.4	,6	Porcupine		NS	NS	14.2		5
Baldy	1/30	14	3. 2	5.0	5.5	7	Wolf Creek Summit	1/31	60	20.1	31.4		7
Fort Apache	1/30	15	2.9		5.7	6	Hiway	1/31	51	16.6	NS		2
Pacheta	1/30	0	0.0	3.0	2.7	8	Pass Creek	1/31	29	9.3	15.1		2
							ALAMOSA RIVER						
VERDE RIVER							Silver Lakes	1/30	21	4.0	9.0	4.7	18
Iron Springs*	1/31	0	0.0	5.1	1.7	12	Summitville (a)	2/7	45	11.3	16.5	11.3	13
Camp Wood	1/31			3.5	1.5	12							
Mingus Mountain	1/30	0	0.0	2.9	1.7	11	CONEJOS RIVER						
Mormon Lake*	1/30	0	0.0		5.1	10	River Springs	1/30	17	3.0	10.3	6.0	17
Fort Valley*	1/31	Т	T	2.7	2.9	11	Cumbres Pass (a)	2/7	40	10.2	20.6	13.7	19
Chalendar*	2/1	0	0.0	3. 7	3.4	11	Platoro		NS	NS	NS		
Munds Park	2/1	0	0.0		2.4	7	West Conejos		NS	NS	NS		
Casner Park	1/30	0	0.0		3.9	7	La Mange (a)	2/7	52	13.1	23.0		7
Mormon Mt.	1/31	0	0.0		4.8	7							
Happy Jack	1/31	0	0.0	4.1	3.4	4	SANGRE DE CRISTO	RAN	GE (C	OLORA	DO)		
							LaVeta Pass	2/1	23	5.0	12.4	5.6	18
LITTLE COLORA	DO RI	VER					Culebra		NS	NS	8.7	6.9	18
Forest Dale*	1/30	0	0.0	2.6	12	18							
McNary	1/30	0	0.0	2.8	3.0	19	CHAMA RIVER						
Nutrioso*	1/31	0	0.0	1.0	2.5	20	Cumbres Pass (a)	2/7	40	10.2	20.6		19
Mormon Lake	1/30	T	T		5.1	10	Payrole (a)	2/7	37	8.1	11.2	7.1	17
Fort Valley	1/31	0	0.0	2.7	2.9	11	Chama Divide	1/30	15	3.3	5.1	4.4	18
Mormon Mt.	1/31	T	T		4.8	7	Chamita	1/30	31	4.8	12.3	7.0	16
Happy Jack	1/31	0	0.0	4.1	3.4	4	Bateman		NS	NS	11.0		8
Gentry	2/1	T	T		2.9	7							
Heber	2/1	T	T		3.1	7	PECOS RIVER						
Canyon Creek	1/30	T	T				Panchuela		NS	NS	1.7	3, 1	19
							Big Tesuque	2/1	17	5.0	4.5	4.4	16
VILLIAMS RIVER	}						Rio En Medio*	2/1	25	6.3	6.5		8
ron Springs	1/31	T	T	5.1	1.7	12							
Camp Wood*	1/31	0	0.0	3.5	1.5	12	RIO GRANDE IN NE	W ME					
Willow Ranch	2/1			0	0.8	9	Red River		NS	NS	10.5	5.5	18
							Taos Canyon	1/30	13	3.7	6.3	4.7	18
LOWER COLORA							Aspen Grove	1/31	16	3.9	3, 5	3.8	19
Bright Angel	2/1	16	4.5	11.8	7.8	10	Hematite Park*	1/30	19	5.4	4.2	3. 7	17
Grand Canyon	1/31	5	0.7	3.1	2.6	10	Tres Ritos	1/30	20	4.3	4.8	4.5	19
Fort Valley	1/31	0	0.0	2.7	2.9		Payrole(a)	2/7	37	8.1	11.2	7.1	17
Chalender	2/1	T	Т	3.7	3.4	11	Cordova (a)	2/7	39	10.5	11.0	7. 1	16
							Big Tesuque	2/1	17	5.0	4.5	4.4	16
F	RIO GR.	ANDE	DRAIN	AGE			Elk Cabin	1/30	13	3.8	2.6		10
							Rio En Medio	2/1	25	6, 3	6.5		8
RIO GRANDE IN C							Quemazon	1/01	NS	NS	NS		
Volf Creek Pass	1/31		16.7	33.2	17.6		Fenton Hill	1/31	21	5.1	2.4		6
Jpper Rio Grande	,		8.2	7.3	5.3		CANADIA						
Santa Maria	1/31	18	4.5	5.9	3.8	19	CANADIAN RIVER	. /			4.0	0.7	1.5
							Hematite Park	1/30	19	5.4	4.2	3.7	17
							Tres Ritos	1/30	20	4.3	4.8	4.5	19
On adjacent dra * Averages for c during the peri	ourses	with 1 8-52 a	ess than re parti	n 15 years ally estim	of rea	cord	Cordova (a)	2/7	39	10.5	11.0	7.1	16
NS No Survey a) Air observed	2030		- purit		.arca,								

SOIL MOISTURE MEASUREMENTS*

DRAINAGE BASIN		Root	Zone Sc	il Moist	ure Content	DRAINAGE BASIN		Root Zone Soil Moisture Conter					
AND	Date	Cap	1958	1957	1956	AND	Date	Cap	1958	1957	1956		
STATION		In.	In.	In.	In.	STATION		In.	In.	In.	In.		
NORTH PLATTE						UPPER COLORADO							
Columbine Lodge		8.0	4.5	0.0	0.3	Vail Pass		8.0	5.4	0.3	1.0		
Willow Creek		7.0	6.8	2.2	3. 1	Ranch Creek		7. 0	5.8	1.7			
Windy Point (Wyo.)			- • •			Hairpin		8.0	6.4	0.0			
Barrett (Wyo.)						Vasquez		7. 0	5. 9	1.4			
()						Gore Pass		7. 0	1. 9	0.7			
SOUTH PLATTE						Blue River		7.0	6.8	0.3			
Red Feather		6.0	1.6	0.5	0.7					0, 0			
Chambers Lake		7.0	3.3	2.2	1.9	GUNNISON							
Deer Ridge		6.0	1.0	0.7	0.8	Monarch Pass		8.0	7. 3	3.8			
Hidden Valley		8.0	5.3	1.7	3. 2								
Longs Peak		7.0	0.8	0.6	1.4	RIO GRANDE (Colo.)							
University Camp		7.0	1.3	0.8	0.9	Bristol View		7.0	6.9	0.6	0.3		
Berthoud Falls		6.0	3. 1	0.4	1.4	Wolf Creek Pass		9.0	6.0	0.7	3.8		
Alma		7.0	4.4	0.7		River Springs		7.0	1.9	2.5	0.5		
Kenosha Pass		7.0	6.3	0.9		La Veta Pass		8.0	2.4	3.0			
ARKANSAS						RIO GRANDE (N. M.)							
Leadville		7.0	2.7	1.3	1.4	Red River		7.0	6.4	0.6	3.5		
Lake Creek		6.0	5. 1	2. 3		Tres Ritos		7.0	4.6	0.5	2.6		
Garfield		7.0	6.4	3.4		Bateman		8. 0	7.6	4.0			
Garriora		•••	٧. ٠	0, 1		Chamita		8.0	4.3	1. 2			
ROARING FORK								0. 0	1.0				
Placita		8. 0	4.7	1.2	0.9								
Maroon		8. 0	3.7	0.4	1.5								

^{*}Measurements made about November 1. Maximum Record five years. Interpretation methods are tentative so figures are subject to change in later years.





Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"